

SERIAL NO. 09/426,644

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IN THE CLAIMS:

Please AMEND claim 2, as follows:

1. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses at once, comprising:

forming a nozzle part by a spinning process; and
adhering a membrane to the formed nozzle part and a heat driving part including fluid chambers for the corresponding fluid jetting apparatuses so as to position the membrane between the heat driving part and the nozzle part to separate the fluid chambers from nozzles of the nozzle part in order to form the fluid jetting apparatuses in a shape of an undivided wafer to be split into separate fluid jetting apparatuses.

2. (CURRENTLY AMENDED) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 1, further comprising:

forming electrodes and heating elements on a first substrate of a wafer;
forming driving fluid barriers on the electrodes and the heating elements; and
forming the fluid chambers in the driving fluid barriers, to form the heat driving part.

3-12 (CANCELED)

13. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses, comprising:

forming electrodes and heat elements on a first substrate of silicon wafer, forming driving fluid barriers on the electrodes and heat elements, and driving fluid chambers in the driving fluid barriers, to form a heat driving part;

forming a polyimide coating layer on a second substrate of silicon wafer, forming an adhesive polyimide coating layer on the polyimide coating layer, attaching a first reinforcing ring to the adhesive polyimide coating layer, and separating the polyimide coating layer from the second substrate after attaching the first reinforcing ring on the adhesive polyimide coating layer, to form a membrane;

attaching a second reinforcing ring beneath a third substrate of silicon wafer by a spinning process, forming a nozzle plate on an opposite side of the third substrate from that of the second reinforcing ring, forming jetting fluid barriers on the nozzle plate, forming jetting fluid chambers in the jetting fluid barriers, and forming nozzles in the nozzle part;

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adhering the polyimide coating layer of the membrane to the jetting fluid barriers, and separating the second reinforcing ring and the third substrate of silicon wafer, from the nozzle plate; and

adhering the adhesive polyimide coating layer of the membrane to the driving fluid barriers of the heat driving part.

14. (ORIGINAL) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 13, wherein the forming of the polyimide coating layer on the second substrate and the forming of the adhesive polyimide coating layer on the polyimide coating layer are accomplished by the spinning process.

15. (ORIGINAL) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 13, wherein the forming of the nozzles in the nozzle plate is accomplished by using a laser beam from a treating apparatus.

16. (ORIGINAL) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 13, wherein the forming of the nozzles in the nozzle plate is accomplished by a process of reactive ion etching.

17. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses at once, comprising:

forming a nozzle part on a silicon wafer by a spinning process;

adhering the nozzle part with the silicon wafer to a membrane;

removing the silicon wafer from the nozzle part; and

adhering the membrane with the adhered nozzle part to a heat driving part such that the membrane is between chambers in the heat driving part and jetting fluid chambers of the nozzle part to form the fluid jetting apparatuses as an undivided unit.

18. (CANCELED)

19. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses at once, comprising:

forming a nozzle part on a silicon wafer by a spinning process;

adhering the nozzle part with the silicon wafer to a membrane;

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removing the silicon wafer from the nozzle part; and
adhering the membrane with the adhered nozzle part to a heat driving part such that the membrane is between the heat driving part and jetting fluid chambers of the nozzle part to form the fluid jetting apparatuses as an undivided unit,
wherein the forming of the nozzle part comprises:
forming a nozzle plate on a first substrate by the spinning process;
forming the jetting fluid barriers on the nozzle plate by the spinning process;
forming a first reinforcing element on the first substrate;
forming the jetting fluid chambers between corresponding adjacent pairs of the jetting fluid barriers; and
forming nozzles in the nozzle plate.

20. (CANCELED)

21. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses at once, comprising:

forming a nozzle part on silicon wafer by a spinning process, the forming the nozzle part comprising:
forming jetting fluid barriers on the nozzle plate by the spinning process;
forming a first reinforcing element on the first substrate;
forming jetting fluid chambers in the jetting fluid barriers; and
forming nozzles in the nozzle plate;
forming a membrane, the forming the membrane comprising
forming a polyimide coating layer on a second substrate of silicon wafer;
forming an adhesive polyimide coating layer on the polyimide coating layer;
forming a second reinforcing element on the adhesive polyimide coating layer;

and

separating the polyimide coating layer from the second substrate after forming the second reinforcing element on the adhesive polyimide coating layer;

adhering the nozzle part with the silicon wafer to the membrane;
removing the silicon wafer from the nozzle part; and
adhering the membrane to a heat driving part.

22. (CANCELED)

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23. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses at once, comprising:

forming a nozzle part on a silicon wafer by a spinning process;

adhering the nozzle part with the silicon wafer to a membrane;

removing the silicon wafer from the nozzle part;

adhering the membrane with the adhered nozzle part to a heat driving part such that the membrane is between the heat driving part and jetting fluid chambers of the nozzle part to form the fluid jetting apparatuses as an undivided unit;

forming the heat driving part, the forming the heat driving part comprising:

forming electrodes and heat elements on a substrate of another silicon wafer;

forming driving fluid barriers on the electrodes and the heat elements; and

forming driving fluid chambers between corresponding pairs of the driving fluid barriers with the electrodes and the heat elements forming bottom sides of the corresponding driving fluid chambers and separated from the corresponding jetting fluid chambers by the membrane, each of the bottom sides being between the corresponding pair of the driving fluid barriers.

24. (ORIGINAL) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 21,

forming the heat driving part, comprising

forming electrodes and heat elements on a third substrate of silicon wafer;

forming driving fluid barriers on the electrodes and the heat driving elements; and

forming driving fluid chambers in the driving fluid barriers.

25-26. (CANCELED)

27. (PREVIOUSLY PRESENTED) A process of manufacturing a plurality of fluid jetting apparatuses, comprising:

forming a nozzle part on a first substrate of silicon wafer by a first spinning process;

forming a membrane on a second substrate of silicon wafer by a second spinning

process;

forming a heat driving part by forming electrodes and heat elements on a third substrate of silicon wafer;

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removing first, second, and third substrates from the corresponding formed nozzle part, membrane, and heat driving part; and

adhering the nozzle part to the membrane, and the membrane to the heat driving part to form the fluid jetting apparatuses as an undivided piece to be separated into individual fluid jetting apparatuses.

28-29. (CANCELED)

30. (PREVIOUSLY PRESENTED) The process of manufacturing a plurality of fluid jetting apparatuses as claimed in claim 27, wherein:

the forming of the electrodes on the third substrate is performed by a lithography process or a wet etching process; and

the forming of the heat elements on the third substrate is performed by the lithography process, the spinning process or a lift-off process.

31-37. (CANCELED).

38. (PREVIOUSLY PRESENTED) The process of claim 1, further comprising splitting the fluid jetting apparatus in the form of the wafer into separate fluid jetting apparatuses.

39. (CANCELED)

40. (PREVIOUSLY PRESENTED) The process of claim 17, further comprising splitting the adhered nozzle part, membrane, and heat driving part into separate fluid jetting apparatuses.

41. (CANCELED)

42. (PREVIOUSLY PRESENTED) The process of claim 27, further comprising splitting the adhered nozzle part, membrane, and heat driving part into separate fluid jetting apparatuses.

43-47. (CANCELED)